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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/591,180	08/30/2006	Kotaro Satoh	295482US0PCT	7756
22850	7590	06/05/2008		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER TESKIN, FRED M	
			ART UNIT 1796	PAPER NUMBER
			NOTIFICATION DATE 06/05/2008	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/591,180	Applicant(s) SATO ET AL.	
	Examiner Fred M. Teskin	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20060830</u> . | 6) <input type="checkbox"/> Other: ____. |

The preliminary amendment filed 30 August 2006 has been entered. Claims 1-9 are currently pending and under examination herein.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-9 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over DE 3710468 A1 (all references thereto being to the corresponding English language translation furnished herewith).

DE '468 has disclosed and claimed an organolithium initiator for anionic polymerization, which is characterized by a formula depicting a β -substituted styrene

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derivative wherein an α -lithio benzyl moiety is attached to B *via* a $-\text{CHR}^1-$ linkage, B is defined as a hydrogen atom or a $-\text{CH}_2-\text{X}^2-\text{Li}$ radical, X^2 is $-\text{O}-$ or $-\text{NR}^5-$ and R^1 and R^5 are each an alkyl or aryl radical (see claim 2 on pages 2-3). In reference to applicants' formula (i), the disclosed initiator comprising $-\text{CH}_2-\text{X}^2-\text{Li}$ and wherein both R^1 and R^5 are alkyl corresponds to an organolithium compound within claims 1 and 6 when the heteroatom A is oxygen and n and m are 1 and 0, respectively, or when A is nitrogen and $n = m = 1$. In reference to claims 2, 3, 7 and 8, DE '468 furthermore describes a method for preparing the initiator claimed therein by reacting an organolithium compound of formula R^1-Li with a ring- or side chain-substituted vinyl aromatic compound, where R^1 is an alkyl or aryl radical, and where the reaction is carried out in such a way that the molar ratio of organolithium compound to vinyl aromatic compound is in the range of $(n + 0.5) : 1$ to $(n + 1.5) : 1$, where n is the number of hydrogen atoms bound to the hetero-atoms (see page 13, bridging paragraph). A molar ratio of $(n + 0.9) : 1$ to $(n + 1.0) : 1$ is characterized as preferable, and these ratios fall fully within the applicants' range as to amount of organolithium compound used in the claimed method, relative to amount of the β -substituted styrene derivative. Moreover, DE '468 exemplifies the preparation of a hydroxyl-terminated (i.e., end-functionalized, per claim 9) polybutadiene with an initiator based on cinnamyl alcohol (see Example 17 on pages 27-28). Per the exemplified procedure, the initiator was prepared by admixing 13 mmol cinnamyl alcohol and 26 mmol s-BuLi, stirring the material for 2 hours at 50°C and then adding butadiene to perform the polymerization. Cinnamyl alcohol corresponds to applicants' β -styrene derivative when A is oxygen, R^2 is $-\text{CH}_2-$ and n and m are

respectively 1 and 0 in claim formula (ii); hence the relative amount of s-BuLi used in the cited example is 2:1 or “more than n moles to not more than (n + 1) moles,” in accordance with claims 2, 3, 7 and 8. Further as to claims 4 and 5, note the teaching of specific alkylene oxides as functionalization agents and of polyisocyanates and polyepoxides as crosslinking agents for the bifunctional polymer (page 15, final paragraph and page 16, first full paragraph). In light of this teaching, it is submitted that one of ordinary skill would have immediately envisaged or, at a minimum, found obvious the utilization of capping and coupling agents as here claimed to modify the living anionic chain end of the terminally functionalized polymer prepared per DE '468.

Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 2004/007563 (Bridgestone).

Bridgestone has disclosed a functionalized lithium-containing anionic polymerization initiator which is a functionalized styryl derivative wherein an α -lithio benzyl moiety is attached to a functional group A *via* a hydrocarbylene group, and wherein the β -carbon is substituted with a hydrocarbyl such as alkyl (see page 3, line 28 to page 4, line 5). Among exemplary functional groups, amine, phosphine, ether and thio ether groups are mentioned (see page 3, line 20 to page 7, line 10). An organolithium compound represented by applicants' formula (i) (claims 1 and 6) is not specifically disclosed; however, Bridgestone teaches an initiator preparation method corresponding to the applicants' method for producing a functionalized anionic polymerization initiator. That is, in one embodiment the Bridgestone initiator is prepared

by reacting a functionalized styryl reagent represented by the formula (X) with an organolithium compound corresponding to applicants' formula (iii) (e.g., n-butyllithium; see page 8, line 16 to page 9, line 5). Reaction of n-butyllithium with a β -substituted styrene derivative within applicants' formula (ii) (claims 2 and 7) is at least suggested by the teaching of amine groups (II) as functional group A in the formula (X) (see page 5). In this regard, it is noted that applicants' compound (ig) (Specification page 26) includes the same type of amine functionality. Furthermore, Bridgestone states the functionalized styryl reagent and the organolithium can be reacted in a 1:1 molar ratio, although an excess of either reagent can be employed (see page 8, lines 18-20). Guided by these teachings, it would have been obvious to one of ordinary skill in the art at the time of invention to undertake the disclosed reaction by combining a functionalized styryl reagent containing the requisite heteroatom and n-butyllithium in proportions corresponding to a molar amount within claims 2, 3, 7 and 8, with a reasonable expectation of obtaining an organolithium compound embraced by applicants' formula (i) and possessing equivalent utility in initiating an anionic polymerization. As to claims 4 and 5, Bridgestone's teaching of tin tetrachloride, silicon tetrachloride and epoxides as preferred terminators (page 15, lines 13-15) would have suggested and rendered obvious to the ordinarily skilled practitioner selection of known capping or coupling agents such as an alkylene oxide compound or a multi-functional coupling agent, as claimed, to reactively modify the living anionic chain end of the functionalized polymer therein. Further as to claim 9, polymers produced per Bridgestone are necessarily end-functionalized owing to the presence of functional

group A at a terminus of its organolithium initiator, in analogy to the cyclic aminoalkyllithium compounds mentioned therein as examples of prior art initiators used to produce polymers having enhanced head functionality (see page 1, lines 20+).

No claims are in condition for allowance at this time.

Any inquiry concerning this communication should be directed to Examiner F. M. Teskin whose telephone number is (571) 272-1116. The examiner can normally be reached on Monday through Thursday from 7:00 AM - 4:30 PM, and can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The appropriate fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Fred M Teskin/

Primary Examiner, Art Unit 1796